

What is claimed is:

1. A method for maintaining a backup storage system for a data storage system comprising:

receiving a plurality of data writes from an application program, the plurality of data writes occurring between a first time and a second time;

determining a backward increment between data on the data storage system at the second time and data on the data storage system at the first time based on the plurality of data writes from the application program to the data storage system;

storing the backward increment;

storing the plurality of data writes; and

updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time.

2. The method of claim 1, further comprising:

determining a forward increment between the data on the data storage system at the first time and the data on the data storage system at the second time based on the plurality of data writes.

3. The method of claim 2, further comprising:

associating the backward increment with the forward increment.

4. The method of claim 2, further comprising:

storing the forward increment; and

storing the association of the backward increment and the forward increment.

5. The method of claim 1, further comprising:

storing indicia of the plurality of data writes.

6. The method of claim 1, wherein said updating the backup storage system comprises:
applying each of the plurality of data writes to an image of data on the backup storage system, thereby recreating the data on the data storage system at the second time.
7. The method of claim 6, said applying each of the plurality of data writes comprising:
updating the image of the data stored on the backup storage system with the plurality of data writes.
8. The method of claim 1, wherein said updating the backup storage system comprises:
optimally applying the plurality of data to the backup storage system, thereby recreating the data on the data storage system at the second time.
9. The method of claim 1, wherein a difference between the first time and the second time is a predetermined time period.
10. The method of claim 1, wherein a difference between the first time and the second time is a variable time period.
11. The method of claim 10, wherein a difference between the first time and the second time is dependent on the rate of the plurality of data writes.
12. The method of claim 7, wherein a difference between the first time and the second time is dependent on a quantity of the plurality of data writes.

13. The method of claim 1, further comprising:
updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time.
14. The method of claim 13, wherein said updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time includes applying the backward increment to an image of data on the backup storage system, thereby recreating the data on the data storage system at the second time.
15. The method of claim 14, wherein said updating the backup storage system so that the data on the data storage system at the first time is the same as the data on the backup storage system at the first time includes applying an individual data write to the image of data on the backup storage system, thereby recreating the data on the data storage system at a point in time between the first time and the second time.
16. A method for restoring data on a data storage system from data on a backup storage system, the backup storage system including a plurality of transactions, each transaction corresponding to a plurality of data writes to the data storage system, the method comprising:
receiving an estimated transaction location;
identifying a transaction associated with the estimated transaction location; and
applying an individual data write subsequent to the identified transaction to an image of data on the backup storage system, thereby recreating data on the data storage system at the time of the individual data write.

17. The method of claim 16, wherein the individual data write is a first data write, the method comprising:

applying a second individual data write to the image of data, thereby recreating data on the data storage system at the time of the second individual data write, the second individual data write being located immediately subsequent to the first individual data write.

18. The method of claim 16, wherein each transaction includes a backward increment between data on the data storage system at a second time and data on the data storage system at a first time based on the plurality of data writes, and a forward increment between data on the data storage system at the first time and data on the data storage system at the second time based on the plurality of data writes.

19. The method of claim 18, wherein the identified transaction corresponds to the first time, and said applying an individual data write includes applying the individual data write that is subsequent to the first time.

20. A method for using a backup storage system for a data storage system comprising:

receiving a plurality of data writes captured between an application and the data storage system, the plurality of data writes occurring between a first time and a second time;

identifying data blocks in the data storage system that were changed based on the plurality of data writes;

applying the plurality of data writes to an image on the backup storage system;

determining a forward increment between data on the data storage system at the first time and data on the data storage system at the second time based on the plurality of data writes;

determining a backward increment between data on the data storage system at the second time and data on the data storage system at the first time based on a plurality of data writes;

storing the forward increment;
storing the backward increment;
storing the plurality of data writes; and
updating the backup storage system so that the data on the data storage system at the second time is the same as the data on the backup storage system at the second time.

21. A computer system comprising:
an application;
a logical volume management device, said logical volume management device capturing data writes from said application; and
a production volume set, said production volume set being associated with said application, wherein said logical volume management device forwards said data writes from said application to said production volume set.
22. The computer system of claim 21, wherein said production volume set includes at least one of a logical volume and a physical volume.
23. The computer system of claim 22, wherein said at least one of a logical volume and a physical volume are spread across a plurality of volume groups.
24. The computer system of claim 21, wherein said production volume set encapsulates a production image of a particular database on the computer system.
25. The computer system of claim 21, wherein said production volume set represents the data state of said application.